

What is claimed is:

1. A plate for projection lithography comprising:

5 a first opaque region located at the center of the plate; and
a second opaque region formed at an outer edge of the plate, said
first and second opaque regions defining an annular region therebetween,
said annular region being light transmissive and comprising a first light
transmissive area that imparts a first phase shift to light passing
10 therethrough and a second light transmissive area, which imparts a
second phase shift to light passing therethrough.

2. The plate of Claim 1 wherein said first light transmissive area comprises
two opposed regions being substantially vertically oriented and on opposed
15 portions of said annular region.

3. The plate of Claim 1 wherein said second light transmissive area
comprises two opposed regions being substantially horizontally oriented and on
opposed portions of said annular region..

20 4. The plate of Claim 1 wherein said second phase shift differs from said first
phase shift by between 45 degrees and 315 degrees.

5. The plate of Claim 4 wherein said second phase shift differs from said first phase shift 180 degrees.

6. The plate of Claim 1 wherein said first light transmissive area has a first
5 thickness and said second light transmissive area has a second thickness and
the difference between said first and second light transmissive areas is equal to
 $1/(2n_{\text{ref}})$ wavelengths of an illuminating light source.

7. A plate for projection lithography comprising:

an opaque region; and

a first, second, third, and fourth light transmissive region formed

5 around the periphery of said plate, said first and second light transmissive regions substantially vertically oriented and oppositely located and imparting a first phase shift to light passing therethrough, said third and fourth light transmissive regions substantially horizontally oriented and oppositely located and imparting a second phase shift to light passing
10 therethrough.

8. The plate of Claim 1 wherein said second phase shift differs from said first phase shift by between 45 degrees and 315 degrees.

15 9. The plate of Claim 8 wherein said second phase shift differs from said first phase shift 180 degrees.

10. The plate of Claim 1 wherein said first and second light transmissive areas have a first thickness and said third and fourth light transmissive area have a
20 second thickness and the difference between said first and second and said third and fourth light transmissive areas is equal to $1/(2n_{ref})$ wavelengths of an illuminating light source.

15. The plate of Claim 11 wherein said opaque region is comprised of a chromium film.

16. The plate of Claim 11 wherein said first and second light transmissive regions have a first thickness and said third and fourth light transmissive regions have a second thickness.

20. The system of claim 17 wherein said first phase shift and said second phase shift differ by between 45 and 315 degrees.

21. The system of claim 17 wherein said aperture comprises an annular
5 aperture and said first and second light transmissive areas are formed within a light transmissive annular region of said aperture.

22. A method of photolithographically imposing a pattern on a semiconductor wafer, comprising the steps of:

coating the wafer with a resist layer;

5 providing a coherent light illumination source;

deriving incoherent light from said illumination source by passing light from said illumination source through an aperture, the aperture having a opaque region in its center and having a first light transmissive area that imparts a first phase shift on light passing therethrough and a second light transmissive area

10 that imparts a second phase shift on light passing therethrough;

passing said incoherent light through a photomask having a pattern formed thereon; and

illuminating the resist layer with the incoherent light after the incoherent light has passed through said photomask.

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23. The method of claim 22 wherein said first phase shift is zero degrees.

24. The method of claim 22 wherein said first phase shift and said second phase shift differ by between 45 degrees and 315 degrees.

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